



# Hay and Silage: Two Effective Ways of Animal Feed Ingredients Preservation for the Underdeveloped Rural Societies

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Two common things but just a few who knows, Hay and Silage, are used by the breeder for feeding their cattles. For some underdeveloped rural regions in some countries, Hay and Silage are two things have to be introduced for assisting the underdeveloped rural society for the enhancement of their cattle quality. The aim of this research is earned through familiarizing and implementing a model of empowerment of the people in underdeveloped regions based on local resource potential in an effort to improve the welfare of people in underdeveloped regions are the purpose of this study. The approach used in this study is a synergistic approach by government institutions, religious and profession with the mechanism of Participatory Rural Appraisal (PRA). Strategic efforts to empower communities can be pursued in synergy through the potential development of local models. Agropolitan based regional development or Integrated farming such as Hay and Silage are the main ideas in this study which is being the media of the empowerment society in underdeveloped region like Madura and also being the strength of this research.

**Keywords:** Hay, Silage, Participatory Planning, Animal Feed, Underdeveloped Region.

## 1. INTRODUCTION

The development of underdeveloped regions is a priority of government policy. Until now it has not found yet a formula which is a comprehensive and integrated strategy to be the solution of it. The development of underdeveloped regions in Indonesia tend to rely on the local developed region. The linkage between underdeveloped and developed areas is a necessity that should be encouraged by the cooperation between the regions underdeveloped behind developed areas so that the benchmark paradigm of society is not likely to have concentration to develop advanced areas only. As a result, people's lives in disadvantaged areas made little headway.

The pattern of development in underdeveloped areas still hold on Strategic Planning which only take into account the available resources to make the priorities that need to alleviate disadvantaged areas from the issues that developed in the community. This pattern of development has not touched on the potential for rural policy to be developed. As an example of the weakness of the connectivity between villages in underdeveloped areas such as: the lack of quality of Human Resources (HR) and the difficulty of accessibility that cause the application of science and

technology inhibited, with the result that the disparity between regions in disadvantaged areas and developed areas.

Currently in Indonesia there are 183 districts in 27 provinces classified within the underdeveloped regions. Nine of them are located in Java. Determination of underdeveloped regions using the approach of six basic criteria are: economy, society, human resources, infrastructure, the ability of local financial (fiscal gap), accessibility, and regional characteristics. in this case as an indicator of existing problems in underdeveloped regions. Underdeveloped regions in general have the conditions of human resources is relatively low, which is characterized by the human development index (HDI) is low.

It is seen from the low average of school accomplishment, the literacy rate and life expectancy rate. Underdeveloped regions also have limited infrastructure and means of communication, transportation, water supply, irrigation, health, education, and other services so that they are difficult to conduct social and economic activities. There are three important components of national security, namely (1) economic instruments, where the underdeveloped regions with a wealth of natural resources need to be well managed so as to improve their welfare. The impoverished societies will have a pride in being the nation Indonesia and willing to sacrifice for the nation. (2) The instrument of human resources, and (3) the technology Instruments. The Development

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for the society well-being can not be realized without the technology in managing natural resources, building infrastructure and information technology systems that support the defense. The Independence in the field of technology impact on impoverished communities deterrence against external threats.

The empowerment of Indonesian society in large part directed at regions classified as underdeveloped regions. Underdeveloped regions is the district that the community and the region is relatively underdeveloped than other regions on a national scale. The determination of underdeveloped regions using the approach of six basic criteria are: economy, society, human resources, infrastructure, local financial ability (fiscal gap), accessibility, and regional characteristics.<sup>1</sup>

### 1.1. Participatory Planning

The concept of empowerment itself basically refers to the theory of development where there are two levels of modernist concept that are modernist adherents with their concept of state-center development and the populist adherents with their people-center development concept. Participatory planning is one of the tools that are believed capable of delivering better results in the planning process.<sup>2,3</sup> This occurs because in the process of planning, participatory planning will be able to increase the activity of greater participation among the current members. In another study mentioned that participatory planning can also be used for the evaluation of interaction possibilities being more complex in terms of participation.<sup>6,7</sup>

Public participation in development is a matter that is considered very important. In the study which focuses on the context of environmental governance was also identified using one of the analysis tools such as PPGIS (the public participatory geographic information system).<sup>8</sup> They added that a government which is also defined as the changing “state-society” relationships, which include government agencies or private organizations (for profit and non-profit institutions) are two parallel institutions within a government.<sup>9</sup> In practice, the transformation of government requires not only the authority inheritance from the government sector to the private sector, but also the involvement of the society in the decision making process.<sup>8</sup>

### 1.2. Increasing Added Value

Technically the use of community empowerment model is based on production potential that can be generated by the community itself by using appropriate technology to increase the added value of related products. The use process of appropriate technology to produce and process the product is always based on the market opportunities of the product. Community preparedness is a decisive element for the empowerment process that is based on market demand. The study of the local market and regional markets to identify the type and quantity of products used as a basis for developing the technology. Agricultural products that have been managed well and there is a chance the market is a process of community empowerment based on local potential to increase the income and welfare of the community.

### 1.3. Cattle Feed

As the authors tried to find, the articles about cattle feed are counted so rare in international indexed journals. Some articles which have a correlation with cattle feed are seemed give much benefit for the cattle feed sustainability.<sup>4</sup> Other researches

talked about the effect of salt in drinking water and feed on animal health and meat quality or quantity has received scientific scrutiny<sup>5,6</sup> but some of other are identified with limited success.<sup>7</sup> One of grass type like *P. turgidum* appears to be a high-quality fodder grass for the coastal area of Pakistan, and should be suitable for other sub-tropical regions of the world. It can grow from coastal dunes to inland regions and this research gave economic benefit for the poor.<sup>4</sup>

Another similar topic but it is in the different concentration like how to minimize the problem associated with mycotoxin contaminated animal feed.<sup>8</sup> The impact of mycotoxin contamination is still being debatable. Some researchers conveyed about the contamination of mycotoxin in human health<sup>8–12</sup> and the other conveyed about the impact of those item on animal health and production. Besides its problem, mycotoxin is one of tools for making the poor empowered because it produces economic benefit.

Previous research raised similar region like in Western Kenya. Western Kenya is one of the most densely populated rural areas in the East African highlands. Farmers face poor soil fertility on very small crop-livestock farms.<sup>13</sup> Many ways to enhance the additional value of residues that we find in our environment. Cattle constitute an efficient way of adding value to crop residues through increasing the nutrient content in manure per unit of mass.<sup>14</sup> Cattle management strategies, manure management<sup>14</sup> and the competitive uses for crop residues<sup>15</sup> are several strategies that are able to enhance the development of rural society.

In Indonesia, we will find many underdeveloped regions which need to be assisted for the development of their region and the empowerment of their society. Therefore the objectives of this study are: to identify the real condition in thus underdeveloped region like in Madura island, Indonesia, to find the proper strategies for the cattle fattening, and to make the society aware of this condition. Madura island is one of the regions in Indonesia that still get little attention for some researches with the result that, this research hoped will have some good impacts for the society where this is the difference of this research compared to others.

## 2. METHODOLOGY

The implementation processes of these activities cover:

- (1) The socialization done by the research team of the community development model in underdeveloped regions which is based potential on local stakeholders,
- (2) The model implementation of the empowerment through involving all stakeholders,
- (3) Evaluation and social intervention to ensure policies sustainability and models of the empowerment to improve people welfare in the underdeveloped regions.

Synergism empowerment consists of the central government (Higher Education), local government (provincial, district, sub-district), local communities and colleges (UPN “Veteran” Java) as an actor and the driving force.

The empowerment keyword lies in improving the welfare of both in the economic, social and technical. To obtain the accuracy of the data in this study using a survey method. Data collected in the form of primary and secondary data. Primary data were obtained based on the observation of in-depth interviews and structured interviews that had been prepared previously to individuals, communities and other stakeholders (local government, local community leaders). Data were then discussed in the group discussion (FGD) is participatory, transect, observational

and deep between teams of researchers and informants. This activity is expected to obtain a general overview of the condition of society in a comprehensive manner, potential, problems and constraints as well as alternative solutions according to the needs of society itself. The procedures used in primary data collection are researcher reality. The interpretation only records information corresponding to information obtained by investigators as far as possibly avoided. The new interpretation is done when the data analysis and focus group discussions. Secondary data can be obtained from the relevant agencies.

### 3. RESULTS AND DISCUSSION

Bangkalan, Madura is an agricultural area, with the potential of the livestock sector is a part of agriculture in general, it is spreaded evenly. The potential of the farm includes large livestock (cattle and buffalo), small livestock (goats and sheep), poultry (free-range chicken, chicken laying hens and broilers), livestock hobby (bird ocean, etc.). The development of the potential farms supported by the availability of animal feed ingredients in the form of agricultural and industrial waste (Agriculture and Livestock Bangkalan).

Feeding problems can be solved with creative thinking and trying to explore all the potential that exists to exploit the potential of local feed for livestock feed. Local feed of course must meet both criteria in terms of aspects of nutrition, economic, social, cultural, and must also pay attention to the level of sustainability so that it can be a source of feed materials continues to be available, inexpensive, readily available, non-polluting, and still in accordance with the culture of the people, so it's easy to be accepted among the community.

#### 3.1. Feed Industry

Livestock is more developed, when in the determination of the source and type of feed material composition is maintained. Procurement forage and concentrates to be used in the fattening process should be determined from the beginning, whether to use the resources from outside the location or working on his own. If the available land allows, better forage procurement conducted themselves with how to plant it. Planting forage must take into account the needs of the cows that will be fattened and forage production capacity are concerned.

Planting forage alone will increase the need for labor to plant, maintain and harvest the forage. If the feed material is sought from outside the location, price and mileage factor source to the location should be considered. To feed material in the form of concentrate is more economical use of resources from the outside, and is sought to obtain any materials that the availability is guaranteed throughout the year with an affordable price level and economically profitable. Determining the type of feed material is utmost importance, because it is closely related to the availability of the feed ingredients location fattening. The high availability of feeds makes farmers easier to obtain feed materials needed at a relatively cheap price. If the location of the fattening rice is the production centers, the use of rice straw to be considered, similarly, with the use of sugar cane tops in sugar cane plantations.

#### 3.2. Feed Variations

Forage or fodder are all materials given to cattle in the form of a mixture of organic and inorganic materials to support and meet



Fig. 1. Hay.

the needs of food substances for function and livestock production that is manifested in the form of growth, development and reproduction. One objective of the livestock industry is to convert food into livestock products which can be used by human. To be able to produce, cattle should receive enough nutrients to nourish the body. Judging from the economic aspect, the feed is very strategic role on the farm, because the cost of feed could reach 70% of the cost of production. If the low cost foodstuff usually is a material that is not consumed by humans and readily available in the area. Food substances are the nutrients contained in the food needed to live cattle, produce, and reproduce. Nutrients are: water, carbohydrates, proteins, fats, vitamins, and minerals. So feed is one factor that must be considered in the livestock business. The other factors are the calves, stables, livestock disease, and crop wastes. The preservation of animal feed ingredients can be done in many ways. Two of many ways that is considered as important tools are:

##### 1. Hay

Hay is forage that deliberately cut and dried to be given to the cattle. The ways of making: Forage cut (copper) and then immediately taken to the drying apparatus. Forage is spreaded thinly and every 2 hours we have to flip upside and down. Try to control the drying process taking place in a short time so that the water content reaches approximately 15–20%. When those items dry then collect, press and tie them up for the facility of the storage system. The good Hay: a yellowish green color, fragrance, leaf shape is still intact, not moldy.

##### 2. Silage

Silage is the forage stored in the form of fresh preserved in a silo. The ways of making: Forages made silage are cut approximately 6 cm in order to facilitate compaction in storage. Make the forages withered with the moisture content approximately 60–70%, and give the bran or hatching 4–5% for the



Fig. 2. Silage.

**Table I. Potential local fodder in bangkalan, Madura.**

No	Potential local fodder	Example
1	Forage fresh	Superior grass and leaves.
2	Agricultural waste	Rice straw, peanut shells, peanut meal, and so on
3	The industrial waste	Cassava pulp, pulp, molasses or cane, and so on

preservation material. Stir all of the mixture so that all of the materials are prevalent and then put them to the silo little by little gradually and also trample them to exceed the surface of the silo then close it tightly so that air and water does not get into the silo. Good silage: sour taste and smell, the color is still green and not brown, not sunbathing, not slimy, do not agglomerate.

#### 4. CONCLUSIONS

The two methods of cattle feeds like Hay and Silage are the important ways for the underdeveloped rural region. It can be one of the best tools for enhancing the economic and social value of the society. The implementation of Hay and Silage will make the society of rural region especially for the farmers will get the positive value Indonesia to enhance the development of this region especially in the underdeveloped rural regions and to empower the society there.

**Acknowledgments:** The researchers would like to acknowledge the financial support of the Ministry of Higher Education Research and Technology of the Republic of Indonesia.

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